



Centers for Disease Control and Prevention

CDC 24/7: Saving Lives. Protecting People.™

Morbidity and Mortality Weekly Report (MMWR)

Persons using assistive technology might not be able to fully access information in this file. For assistance, please send e-mail to: mmwrq@cdc.gov. Type 508 Accommodation and the title of the report in the subject line of e-mail.

Trends in Global Health and CDC's International Role, 1961- -2011

Supplements

October 7, 2011 / 60(04);104-111

Kevin M. De Cock, MD

Center for Global Health, CDC, Atlanta, Georgia

Corresponding author: Kevin M. De Cock, MD, Center for Global Health, CDC, MS D69, 1600 Clifton Road, N.E., Atlanta GA 30329-4018; Telephone 404-639-0119; Fax: 404-639-7490; E-mail: kmd2@cdc.gov.

Introduction

In late August 2007, Dr. Peter Kilmarx, a CDC epidemiologist working on HIV/AIDS, awoke at his home in Atlanta to read a text message on his mobile phone. The message, sent the night before, was from Gilbert Shamba Mayi, the chief of Bakawa Tombe, a small village in Kasai Occidental Province in the Democratic Republic of Congo. Dr. Kilmarx had met the chief approximately 20 years earlier while serving in the Peace Corps. The message said in a local Congolese language, "Bakwa Tombe greets you with pleasure. There is a lot of death from Ebola. When are you coming for the hospital? How are you Peter? Chief Gilbert Shamba Mayi."

This real time text message from a "citizen epidemiologist" in a remote Congolese village led to deployment of a CDC team to the affected area in less than 2 weeks, and they determined quickly that the cause of the outbreak was Ebola hemorrhagic fever. Compare this anecdote to an experience of the author of this article, Dr. Kevin DeCock, while he was an Epidemic Intelligence Service Officer 21 years earlier in 1986. A severe outbreak of yellow fever started in Benue State, Nigeria, during the middle of 1986 and had already peaked by the time it came to national attention in October of that year. An outbreak investigation by an international team began in December. By the time the international team arrived, approximately 40,000 yellow fever infections and 5,000 deaths had already occurred (1).

The contrast between these two anecdotes vividly shows how technological change has affected the way CDC and other U.S. agencies do their global work. Large-scale social and technologic changes have wrought changes in international public health practice and these changes will continue, or even speed up, in the future.

One example of these changes is a recent increase in the level of priority accorded to international activities at CDC. Shortly after assuming his role as Director of CDC in 2009, Dr. Thomas Frieden identified five priorities for the agency. One of them was to increase CDC's impact in global health. To support this objective, he created the Center for Global Health, reflecting the increased importance of global health in general, the relevance of global health to health in the United States, and the increased international role of CDC. In this same vein, the U.S. Department of State recently released *The First Quadrennial Diplomacy and Development Review: Leading through Civilian Power (2)*, which emphasized the increased international importance of different civilian agencies whose traditional mandates have primarily been domestic.

As *MMWR* celebrates its 50th year at CDC, a review of *MMWR* articles provides evidence that CDC's global activities have become firmly established as part of the agency's core work. Electronic searching of *MMWR* articles for the words "international" or "global" found only five articles mentioning them in 1983, compared with 130 articles in 2010. CDC responded to five international requests for epidemiologic assistance ("Epi-Aids") before *MMWR* came to CDC in 1961 and to 534 such requests through January 2011.

Evolution of Global Health: Tropical to International to Global

The term *global health* has replaced such earlier names as *international health* and *tropical medicine*. These labels reflect the evolution in scale and scope of the subject and of the work of diverse agencies, including CDC, since the 1960s and of their broader mission and activities. The concept of global health has evolved during the past 50 years from a narrow view of ecologically and geographically restricted health challenges to a broad and comprehensive approach to health in the world as a whole.

Tropical medicine developed in the late 19th and early 20th centuries, an era when many countries of the Southern Hemisphere were colonized by countries of the Northern Hemisphere. It focused on diseases associated with warm climates, many of which were parasitic (e.g., malaria, sleeping sickness, and schistosomiasis). Together with epidemic-prone viral or bacterial diseases, such as yellow fever, typhoid, and dysentery, these tropical diseases were recognized early on as common causes of death and major threats to public health. To prevent and treat these diseases, training in tropical medicine became a priority for institutes preparing northern professionals for overseas service.

The term *international health* became widely used after colonial independence and was accompanied by a change in focus toward aid and humanitarian assistance to countries of the developing world. Infectious and parasitic diseases, maternal and child health, and nutrition were the most common components of these early international health efforts.

Global health now encompasses tropical medicine and international health but extends beyond them in diverse ways (3). It broadens the agenda internationally and considers health at the global level. For example, it includes strengthening and supporting systems required to implement health interventions and mechanisms for coordination of public health activities. It includes health education and prevention and extends to oversight of clinical services appropriate for the local impact of disease. Global health recognizes the reality of globalization and prioritizes public health challenges that transcend individual country boundaries and require collective action, such as threats from infectious agents like HIV, but also from environmental and climate change; rapid and widespread urbanization; and changes in socioeconomic conditions, diet, and lifestyles. Global health is guided by epidemiologic science and research and has as core values concepts of justice, decency, human rights, and health equity. It also recognizes the overwhelming relevance and importance of policy, politics, and diplomacy.

Trends in Global Health, 1961--2011

Advances in global health and science since *MMWR* was established at CDC have been extraordinary ([Table 1](#)). Two infectious agents, smallpox in humans and rinderpest in cattle, have been eradicated. Enormous progress has been achieved toward the eradication of poliomyelitis and dracunculiasis (i.e., guinea worm disease). Polio remains endemic in only four countries (India, Nigeria, Afghanistan, and Pakistan), and cases in 2010 were at an all-time low: 1,292 total (232 in countries where polio is endemic and 1,060 in countries where polio is not endemic) (4). Reports of guinea worm disease in 2010 were lower than ever before (<2,000), from only five remaining affected countries (Chad, Ethiopia, Ghana, Mali, and Sudan).

A host of new or drug-resistant pathogens and associated diseases have been described, with resulting outbreaks of varying severity and distribution that emphasize the necessity for public health preparedness. The most acutely lethal have been the hemorrhagic fevers caused by such agents as Lassa, Marburg, and Ebola viruses, but certain sexually transmitted (HIV) and airborne-transmitted (severe acute respiratory syndrome [SARS], multidrug- and extensively drug-resistant tuberculosis [TB]) agents have had greater public health impact.

A large number of policy initiatives were launched, new bodies established, influential reports published, and philanthropic foundations created, all contributing to a fundamental realignment of global health architecture and governance. At the start of the 21st century, the global community committed to the Millennium Development Goals (MDGs), of which three were specifically devoted to health (MDGs 4, 5, and 6, relating, respectively, to child health; maternal health; and HIV, TB, and malaria).

Other MDGs focusing on economic development have considerable implications for health, most directly MDG 7 relating to environmental sustainability. Progress has been made toward reducing the proportion of persons without access to safe drinking water, currently almost one billion people, but little progress has been made in increasing access to sanitation. In 2008, 69% and 64% of the population of southern Asia and sub-Saharan Africa, respectively, lacked access to basic sanitation (5). Forty-four percent and 27% of persons in these regions, respectively---approximately 1.1 billion persons---had to resort to open defecation, an affront to human dignity (5). That settings exist today where humans have greater access to mobile phones than to toilets reflects unfavorably on globalization.

The World Health Organization (WHO) embraced the goal of malaria eradication in 1955, but this ambitious aspiration was abandoned in the late 1960s in the face of technical and social challenges. During the past few years, the President's Malaria Initiative, the Global Fund to Fight AIDS, Tuberculosis, and Malaria, and other donors have begun to address the estimated 225 million cases of malaria and almost 781,000 deaths annually (2009 estimates) (6). The focus has been on delivering artemisinin-based combination therapies, better diagnostics, insecticide-treated bednets, indoor residual spraying, and interventions for malaria in pregnancy to millions of persons at risk.

As its name suggests, the Global Fund to Fight AIDS, Tuberculosis, and Malaria was developed to address these three diseases that have so disproportionately affected global health, particularly in sub-Saharan Africa. In addition, the President's Emergency Plan for AIDS Relief (PEPFAR), the largest bilateral health program ever mounted, has contributed an unprecedented U.S.\$32 billion thus far to the fight against HIV/AIDS, including against HIV-associated TB (7). Currently, approximately 5.2 million HIV-infected persons in low- and middle-income countries are accessing antiretroviral therapy compared with <400,000 in 2003 (8). Despite remaining the leading infectious disease challenge in global health, the HIV/AIDS epidemic has stabilized, and investments in addressing it are beginning to pay visible

dividends in other spheres of health.

Important demographic changes during the past 50 years have resulted from changing trends in child, maternal, and adult death rates. These rates reflect changing patterns of disease secondary to economic development and specific public health interventions. Child and maternal death rates have been the most important and widely used indicators of health in different countries. In 2008, 7.95--8.8 million deaths occurred among children <5 years of age, compared with 11.9 million deaths in 1990 and approximately 16 million deaths in 1970 (9). Thirty-three percent of these deaths occurred in southern Asia and 50% in sub-Saharan Africa, with the highest death rates for children aged <5 years found in western Africa.

Rates in all components of mortality in children aged <5 years (neonatal, postneonatal, and childhood) are declining, but unequally. Decline has been faster in rates of postneonatal and childhood mortality than neonatal mortality, most likely reflecting investment in preventive services, such as vaccination and malaria prevention, as well as better prevention and management of diarrheal diseases, respiratory infections, and HIV/AIDS. The reduction in global measles-related mortality, estimated at 78% during 2000--2008, has been especially striking. As a consequence of these trends, neonatal mortality, often associated with the same factors as maternal mortality (itself highest in sub-Saharan Africa and southern Asia), accounts for an increasing proportion of deaths in children aged <5 years. As many as 51% of deaths prevented in children <5 years might be attributable to increased education of reproductive-aged women (10).

MDG 5 calls for a 75% reduction in the global maternal mortality ratio from 1990 to 2015. Despite pessimism around this objective, which depends on access to clinical services that include emergency obstetric care, maternal deaths have decreased from an estimated 526,300 in 1990 to 342,900 in 2008 (11). The corresponding reduction in the maternal mortality ratio was from 320 to 251 per 100,000 live-born infants, suggesting that despite this improvement, MDG 5 was unlikely to be met by 2015. MDG 5 also called for universal access to services, such as family planning, in which progress has stalled.

The focus of the health-related MDGs on maternal and child health obscures major trends and underlying causes of adult mortality. However, preventable adult mortality has become a key indicator of health in many countries, reflecting the emerging pandemic of noncommunicable diseases and injuries. By 2010, two deaths occurred among adults aged 15--64 years for every death among children <5 years of age globally, and the ratio is even higher for adults <70 years of age: three deaths among adults to every one death among children (12). Despite marked regional variations and confounders, such as HIV/AIDS and its treatment, these trends toward an increasing ratio of deaths in adults apply worldwide, and they apply disproportionately to males.

These broad mortality trends do not reveal some of the major shocks that caused substantial disruption at the local or regional level. One example is HIV/AIDS, which has had devastating impact in eastern and, especially, southern Africa, causing massive loss of life expectancy. Global HIV incidence is considered to have peaked around 1996 and has declined since then (9). AIDS-related mortality most likely peaked in 2004. Another example is increased mortality in the former Soviet Union during the 1990s. This increase was caused by profound social and political change, and the resultant mortality was at the level usually associated with war and conflict in numerous low- and middle-income countries.

CDC's Role in Global Health

CDC's current global health activities build on the momentum developed through historical collaborations in the eradication of smallpox and continue as global partners strive to fulfill MDGs. CDC's programs are

designed to achieve substantial and positive health outcomes through enhanced health security and strengthened health systems around the world. The agency's global work is characterized by evidence-based public health actions and extensive collaboration with in-country partners and international organizations. These partnerships address in-country needs in surveillance, research, workforce development, and laboratory capacity ([Figure](#)).

Partnerships are the cornerstones of CDC's global work. In addition to collaborating with sister agencies in the federal government, CDC's principal partners in global health are ministries of health (MOHs) and agencies of the United Nations, especially WHO and the United Nations Children's Fund (UNICEF). In addition, CDC works directly with specific in-country nongovernment organizations and health institutes. With CDC offices in 41 countries, and staff assigned to 51 countries, the agency provides technical assistance, mentoring, and emergency surge capacity directly to MOHs and through WHO to build national and regional capacity.

Examples of CDC's direct assistance to MOHs include the agency's HIV/AIDS programs and global disease-detection activities. CDC's Division of Global HIV/AIDS (formerly called the Global AIDS Program) provides direct, peer-to-peer, technical, financial, and program delivery assistance to MOHs. This assistance includes collaborations to build sustainable public health information, laboratory, and management systems. Multiagency work requires interdisciplinary collaboration between clinicians, epidemiologists, health educators, and other scientists, an example of which is the "Basic Care Package." Developed by CDC in 2008, the package combines interventions (antibiotic medication, insecticide-treated bednets, services for screening and management of sexually transmitted infections, prevention of maternal-to-child transmission services, and a safe water tool) that have dramatically reduced illness and improved the quality of life for persons with HIV in Uganda, Ethiopia, Cote d'Ivoire, Kenya, Nigeria, Malawi, Rwanda, Uganda, Vietnam, and Zambia. Through PEPFAR, CDC and its global partners have provided care to >11 million persons affected by HIV/AIDS, including 3.8 million orphans and vulnerable children. More than 3.2 million persons are alive and 114,000 infants are HIV free because of this aid (7).

CDC also responds to MOH requests to assist with the identification and containment of infectious diseases and other health threats. Almost all of CDC's national centers have participated in rapid outbreak investigations, pathogen discovery, training, and networking. During the past decade, CDC has played a lead role investigating and responding to such global threats as pandemic influenza A (H1N1) 2009 and SARS. During 2010, CDC's Global Disease Detection program coordinated the response to 14 direct requests from MOHs for technical assistance related to health threats, including cholera in Haiti and the Dominican Republic, hepatitis E virus in Uganda, lead poisoning in Nigeria, meningitis in Ghana, nodding disease in Uganda and southern Sudan, and polio in the Democratic Republic of Congo.

CDC also partners extensively with multilateral global health organizations. WHO is a key collaborator. Currently, 29 CDC staff members are seconded to WHO headquarters and regional programs, providing expertise in areas such as HIV/AIDS, influenza, meningitis, measles, polio, immunization, sexually transmitted infections, and TB. These partnerships not only provide technical assistance from CDC to agency partners but also create opportunities for CDC to learn directly from communities in-country. For example, CDC staff are currently working as part of the Pan American Health Organization regional Global Water, Sanitation and Hygiene Program cluster in Haiti, learning how tools such as CDC's Safe Water System can be adapted for use in postearthquake Haiti.

Disease surveillance is the foundation for evidence-based public health action, and enhancing global surveillance systems is the foundation of CDC's global health programs. One of CDC's core global health

missions is to share its expertise, raising the level of global health surveillance. The agency trains staff members from partner organizations in the process of collecting, analyzing, interpreting, and disseminating health-related data to better inform solutions globally. CDC and its partners use these data to determine potential interventions; monitor their impact; and determine at-risk populations, disease trends, and potential interventions.

In recent years, CDC has assisted in strengthening several surveillance efforts around the world. For example, CDC's surveillance role is highlighted in the President's Malaria Initiative. CDC advises the U.S. Malaria Coordinator on priorities for surveillance strategies and processes. In 2010, other examples of CDC's global surveillance work included hand, foot, and mouth disease and *Salmonella enterica* serovar Enteritidis in the People's Republic of China; human influenza A (H5N1) infection and Q fever in Egypt; dengue, respiratory syncytial virus, and febrile encephalitis in Guatemala; micronutrients and malnutrition in Jordan, Dominican Republic, and Uganda; and tobacco use among teens and adults in Latin America.

CDC also is involved in research that supports global public health action. The recently released WHO guidelines for TB screening and prevention in persons with HIV infection (13) illustrates how CDC's investment in science influences global health policy and improves health outcomes. Research conducted by CDC in Thailand, Cambodia, and Vietnam in collaboration with the U.S. Agency for International Development and other partners led to more accurate screening for TB so that TB can be diagnosed and treated earlier in persons with HIV infection (13). In another example, CDC collaborated with UNICEF and in-country partners to conduct research on the prevalence of sexual violence against women and girls in Swaziland. The study found that one in three respondents had experienced sexual violence before 18 years of age. The results led to critical policy and programmatic actions, including establishment of child-friendly courts and integration of Domestic Violence and Sexual Offenses units into 75% of police stations in Swaziland.

CDC enhances global public health capacity through in-country workforce development. For approximately 30 years, CDC has invested in developing the skills of the global public health workforce. Through its signature training program, the Field Epidemiology Training Program (FETP), CDC works with MOHs and other partners to train skilled epidemiologists worldwide. Its specialized laboratory track, Field Epidemiology and Laboratory Training Program (FELTP), provides training and support for enhanced in-country laboratory disease surveillance and outbreak response. Through FETP and FELTP, CDC has helped establish 35 self-sustaining programs that have produced approximately 2,100 graduates from 51 countries. The graduates have become leaders of MOHs, reducing dependence on foreign health assistance. Examples of this transition can be found in a recent response to Rift Valley fever in Kenya. In an outbreak during 1997--1998, CDC provided primary leadership for the investigation. In a subsequent outbreak during 2006--2007, primary leadership for the response was provided by staff in Kenya who had trained through the Kenya FELTP, which is implemented jointly with CDC and is now led by Kenyan graduates.

During the past 20 years, CDC also has invested in development of public health management and leadership capacity globally. Through CDC's Sustainable Management Development Program, CDC works with MOHs and other partners to strengthen managers' skills and competencies, improve program operations, and promote changes in policy and health systems.

CDC increases laboratory capacity and extends global laboratory systems. In addition to training laboratorians through FETLP, CDC works alongside its partners to build laboratory capacity and systems.

For example, CDC is the founding member, and chairs the steering committee, of PulseNet International, an international network of seven national and regional laboratory networks dedicated to tracking foodborne infections worldwide. Currently, PulseNet is partnering with reference laboratories throughout the world to build capacity for molecular surveillance of foodborne infections. It has increased collaboration between international reference laboratories through the addition of 82 new member countries since 1996 and collaborated in the advancement of detection, investigation, and control methods of international outbreaks of foodborne infections.

After the devastating earthquake in Haiti on January 12, 2010, CDC deployed staff to rebuild Haiti's laboratory capacity. Haiti's national laboratory was one of the few public health structures in the nation's capital to survive the disaster, but it lacked key supplies and training to detect potential health threats likely to follow the earthquake. CDC and its partners quickly provided equipment, rapid diagnostic tests, and training to Haiti's laboratory technicians. Enhanced capacity has resulted in increased submissions of specimens to the national laboratory; an average of 181 bacteriologic tests are performed each month to confirm diagnoses of diseases ranging from leptospirosis to meningococcal meningitis. As a result of rapid laboratory strengthening in Haiti, the country's National Public Health Laboratory was able to identify cholera cases within days after the outbreak began.

Future Trends in Global Health

These three broad themes provide the framework for CDC's current work around the globe: enhancing public health capacity, increasing health security, and maximizing health impact from programs and interventions (Figure). CDC's future role will continue within this framework with a goal to create increasing in-country public health capacity and independence. CDC hopes to create an analogous relationship between CDC and its global partners that the agency currently has with its domestic state public health partners. CDC has seen its role with U.S. state health departments change from intense engagement initially to a consultative role where local capacity is well established. In a globalized environment, interactions between CDC and its MOH partners may increase, but the scope and intensity of CDC engagement in any country should change to consultation as national and local public health expertise develops. The development and strengthening of national public health institutes globally is a clear step in this direction (14) Country leadership is prioritized by CDC through all its global programs, including PEPFAR and the agency's leadership activities related to the Global Health Initiative.

Despite the unfulfilled commitments relating to the MDGs and infectious diseases, global health discourse and donor prioritization will be influenced by geopolitical and socioeconomic changes. Financial downturn and political changes in donor countries may tighten budgets for health programs for years to come. An emphasis on integration and systems models broadens and strengthens specific disease initiatives. Many countries are in positions to devote more resources to health than they have previously. Some middle-income countries have emerged as leaders in debates around such issues as intellectual property and health policy and could contribute more to global health financially than they currently do.

Discussion will continue about the relative roles and interaction of public health and development internationally. Both are necessary, and neither alone can guarantee sustained health or address all health challenges in a timely and comprehensive manner. Perhaps the most acute test of how well development and public health collaborate and deliver results is the ongoing situation in Haiti as it recovers from the 2010 earthquake and cholera epidemic. Only time will determine whether Haiti emerges from these shocks a stronger and healthier society with better basic infrastructure, such as for water and sanitation.

The disproportionate effect of disease and early death in sub-Saharan Africa inevitably means that much

attention of the global health community will focus on that subregion. Discussion is needed about how best to use resources, including the balance between addressing high rates of disease affecting small populations versus large populations with modest rates that have large numbers of persons affected because of the large denominator. UNICEF has recently prioritized its activities in terms of equity, arguing that disproportionate health impact is obtained from focusing interventions on the most marginalized and underprivileged communities (15). Certain countries (e.g., Nigeria, Democratic Republic of Congo, and Pakistan) contribute disproportionately to child and maternal mortality because of their large size and adverse health indicators and may merit particular attention.

In addition to finishing preexisting commitments to the MDGs, polio eradication, and other infectious disease priorities, several urgent needs stand out. The lack of mortality surveillance in many countries prevents recognition and description of the local impact of disease. The solution is the development of robust vital registration systems in every country, but until that is achievable, systems are needed to capture data on mortality through enhanced surveillance or surveys. Changing global trends in patterns of mortality means that the classic indicators most widely used (child and maternal mortality) fail to accurately describe the health situation---including the increasing proportions of deaths in young adults and the emerging impact of noncommunicable diseases and injuries---in many countries. Obtaining data on preventable adult mortality and its causes is a priority for surveillance systems globally.

To address some of the challenges and assess its own performance, CDC has identified five major public health goals for which major progress can be made with sustained, coordinated effort. These are 1) reduction of mother-to-child HIV transmission and congenital syphilis; 2) enhanced coverage and impact through global vaccination initiatives, including polio; 3) elimination of lymphatic filariasis in the Americas; 4) reduced tobacco use; and 5) decreased motor vehicle injuries. These "winnable battles" have been named as priorities for intervention because of the availability of practical, evidence-based strategies, and the potential for measuring progress across a large proportion of persons at greatest risk. The timelines and specific measurable objectives for CDC's global winnable battles are under development. Approaches to evaluating progress in these areas are under discussion, and priorities may change over time as new challenges or opportunities arise. These topics should not be interpreted as displacing CDC's broad global health portfolio, but they do represent areas for special focus. They will be implemented as part of CDC's comprehensive global health framework of increasing in-country public health capacity, health security, and health impact.

Despite predictions about global health trends, objectives set by the MDGs, and winnable battles, predicting what issues will preoccupy MMWR and global health 50 years from now is risky. Further progress should be expected in the development of diagnostics, including those used at the point of care; drugs; and vaccines. New diseases will continue to emerge; environmental and climate change may become more prominent risk factors for adverse outcomes; and the effect of noncommunicable diseases will continue to grow. Communications capacity can only continue to increase, and the story of Chief Gilbert Shamba Mayi will be less unusual.

Even as the environment changes certain constants will remain, including the need for reliable data for public health action, surveillance, laboratory capacity, a strong health workforce, and research. CDC will also have to evolve, yet remain true to the core values that have guided its work over the years, much of it described in MMWR.

Acknowledgements

The author appreciates the collaboration of Jeffrey Koplan, M.D., Institute for Global Health, Emory

University, Atlanta, Georgia; and Patricia Simone, M.D., Marsha Vanderford, Ph.D., and Terri Still-LeMelle, Center for Global Health, CDC.

References

1. De Cock KM, Nasidi A, Enriquez J, et al. Epidemic yellow fever in eastern Nigeria, 1986. *Lancet* 1988;331:630--3.
2. US Department of State. The First Quadrennial Diplomacy and Development Review (QDDR): leading through civilian power. Available at <http://www.state.gov/s/dmr/qddr>.
3. Koplan JP, Bond TC, Merson MH, et al. Towards a common definition of global health. *Lancet* 2009;373:1993--5.
4. World Health Organization. Global Polio Eradication Initiative. Wild poliovirus weekly update. April 6, 2011. Available at <http://www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx>.
5. United Nations Secretary-General. The Millennium Development Goals Report 2009. Available at <http://www.unhcr.org/refworld/docid/4a534f722.html>.
6. World Health Organization, World Malaria Report 2010. Available at http://www.who.int/malaria/world_malaria_report_2010/en/index.html.
7. President's Emergency Plan for AIDS Relief, 2011. Available at <http://www.pepfar.gov/documents/organization/80161.pdf>.
8. Joint United Nations Global Programme on HIV/AIDS. UNAIDS report on the global AIDS epidemic, 2010. Available at http://www.unaids.org/globalreport/Global_report.htm.
9. Rajaratnam JK, Marcus JR, Flaxman AD, et al. Neonatal, postneonatal, childhood and under-5 mortality for 187 countries, 1970--2010: a systematic analysis of progress towards Millennium Development Goal 4. *Lancet* 2010;375:1988--2008.
10. Gakidou E, Cowling K, Lozano R, et al. Increased educational attainment and its effect on child mortality in 175 countries between 1970 and 2009: a systematic analysis. *Lancet* 2010;376:959--74.
11. Hogan MC, Foreman KJ, Naghavi M, et al. Maternal mortality for 181 countries, 1980--2008: a systematic analysis of progress towards Millennium Development Goal 5. *Lancet* 2010;375:1609--23.
12. Rajaratnam JK, Marcus JR, Levin-Rector A, et al. Worldwide mortality in men and women aged 15--59 years from 1970 to 2010: a systematic analysis. *Lancet* 2010;375:1704--20.
13. Department of HIV/AIDS, Stop TB Department, World Health Organization. Guidelines for intensified tuberculosis case-finding and isoniazid preventive therapy for people living with HIV in resource-constrained settings, 2010. Available at <http://www.who.int/hiv/pub/tb/9789241500708/en/index.html>.
14. Frieden TR, Koplan JP. Stronger national public health institutes for global health. *Lancet* 2010;376:1721--2.
15. United Nations Children's Fund. Narrowing the gaps to meet the goals. Available at http://www.unicef.org/childsurvival/files/Narrowing_the_Gaps_to_Meet_the_Goals_090310.pdf.

TABLE 1. Selected achievements and milestones in global health, 1952--2011

Year Event

1952-1965 Global Yaws Control program, jointly sponsored by WHO and UNICEF, reduces yaws prevalence by 95%.

CDC becomes involved in smallpox eradication program

1962 (<http://www.cdc.gov/about/history/timeline.htm>).

1961,

1962, Oral polio vaccine licensed in the United States.

1963

1964 First US Surgeon General's report on tobacco and health published.

1965 First report on diabetes issued by WHO.

1967 First heart transplant performed by Christiaan Barnard in South Africa.

1969 International Health Regulations (cholera, plague, smallpox, yellow fever) launched by WHO.

1970-
-2002 World child mortality rate down approximately 45% (2003 World Health Report).

1970-
-2010 World child mortality rate declines approximately 52%.

1974 Onchocerciasis (river blindness) initiative launched in western Africa by WHO, the World Bank, the UN Development Program, and the Food and Agriculture Organization; 18 million children spared disease; 600,000 cases of blindness averted.

1976 Ebola virus first identified in Sudan and Zaire (now Democratic Republic of Congo).

1976 Legionnaires disease recognized.

1977 Essential Medicines List developed; 156 countries today maintain list.

1978 The Alma-Ata Declaration of 1978 issued at the International Conference on Primary Healthcare convened by WHO. The declaration became a major milestone in the field of public health. It identified primary health care as a critical element to achieve.

1979 Smallpox eradication declared.

1980 Combating Communicable Diseases Program developed by US Agency for International Development.

1981 First case descriptions of what would become known as AIDS published in *MMWR*.

1983 HIV identified by coworkers from Institut Pasteur, leading to Nobel Prize in Physiology or Medicine in 2008.

1984 Projet SIDA established in Zaire (now Democratic Republic of Congo).

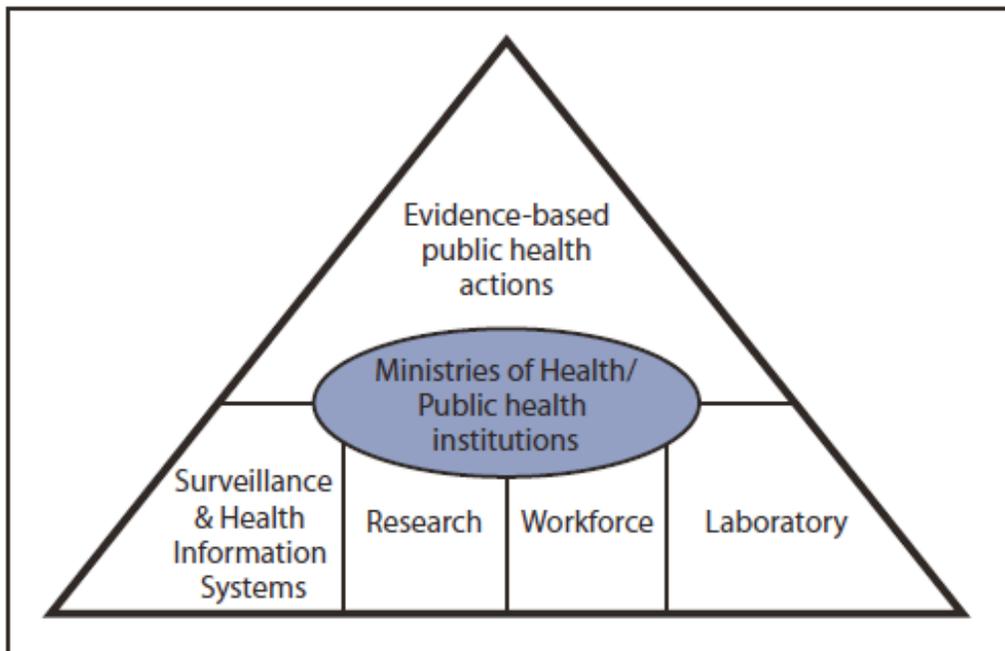
1984 Bhopal, India, environmental disaster occurs.

- 1985 Inaugural CDC Field Epidemiology Training Program (later Field Epidemiology and Laboratory Training Program) launched in Thailand.
- 1986 Chernobyl, USSR (Ukraine), environmental disaster occurs.
- 1986 WHO's first program on HIV/AIDS established.
- 1988 Global Polio Eradication Initiative launched as a result of a resolution passed by the World Health Assembly in 1988 calling for the eradication of polio by 2000.
- 1993 World Bank World Development Report, *Investing in Health*, published.
- 1994 Polio elimination certified in the Americas.
- 1995 Directly Observed Therapy--Short Course program for tuberculosis management launched by WHO.
- 1995 International Commission for Dracunculiasis (guinea worm disease) established.
- 1995 Joint UN Global Programme on HIV/AIDS established.
- 1996 "Final rule" on folic acid flour fortification published by US Food and Drug Administration.
- 1996 Combination antiretroviral therapy highlighted at International Conference on AIDS in Vancouver, British Columbia, Canada.
- 1997 Highly pathogenic H5N1 first described in humans (infected through contact with infected birds) in Hong Kong.
- 1998 Global Youth Tobacco Survey (WHO--CDC initiative) established.
- 2000 UN General Assembly Special Session on HIV/AIDS held.
- 2000 Millennium Development Goals set by the UN as part of the UN Millennium Declaration in 2000.
- 2000 Bill and Melinda Gates Foundation established.
- 2000 International Conference on AIDS held in Durban, South Africa, to highlight AIDS in Africa.
- 2001 Measles control initiative launched jointly by the American Red Cross, UN Foundation, CDC, UNICEF and WHO.
- 2001 WHO Global Strategy for Containment of Antimicrobial Resistance established.
- 2002 Global Fund established.
- 2003 SARS erupts and is controlled.
- 2003 US President's Emergency Plan for AIDS Relief announced.

- 2003 Joint UN Global Programme on HIV/AIDS/WHO "3 by 5" initiative launched to provide ART to 3 million persons with HIV/AIDS in low- and middle-income countries by the end of 2005.
- 2005 International Health Regulations revised.
- Partnership for Maternal, Newborn and Child Health created through the collaboration of the
- 2005 Partnership for Safe Motherhood and Newborn Health (WHO); the Healthy Newborn Partnership (Save the Children USA); and the Child Survival Partnership (UNICEF).
- 2005 US President's Malaria Initiative established.
- HIV/AIDS progress reported. Widespread availability of ART and prenatal interventions reduce
- 2005-2010 vertical transmission; male circumcision demonstrated to reduce transmission; access to HIV testing and counseling improved; novel research into preventatives; (e.g., vaginal gel antiretroviral pills).
- 2008 WHO report on strengthening of health systems, *Everybody's Business*, released.
- 2008 Report on the Social Determinants of Health issued by WHO.
- 2009 Global Health Initiative announced by US President Obama
- 2009 Earthquake in Haiti and subsequent cholera epidemic occur.
- 2010 Severe lead poisoning outbreak occurs in Zamfara State, Nigeria.
- 2010 Meningitis vaccine launched in "meningitis belt" (Burkina Faso).
- Global Polio Eradication Initiative Strategic Plan 2010--2012 released. CDC prepares first
- 2010 quarterly risk assessment for Independent Monitoring Board, which conducts first review of progress toward meeting Global Polio Eradication Initiative milestones.

Abbreviations: WHO = World Health Organization; UNICEF = United Nations Children's Fund; UN = United Nations; SARS = severe acute respiratory syndrome; ART = antiretroviral therapy.

FIGURE. Public health framework for health systems strengthening at CDC



Alternate Text: The figure is a pyramid that presents the framework for CDC's global health work.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

References to non-CDC sites on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of pages found at these sites. URL addresses listed in *MMWR* were current as of the date of publication.

All *MMWR* HTML versions of articles are electronic conversions from typeset documents. This conversion might result in character translation or format errors in the HTML version. Users are referred to the electronic PDF version (<http://www.cdc.gov/mmwr>) and/or the original *MMWR* paper copy for printable versions of official text, figures, and tables. An original paper copy of this issue can be obtained from the Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, DC 20402-9371; telephone: (202) 512-1800. Contact GPO for current prices.

**Questions or messages regarding errors in formatting should be addressed to mmwrq@cdc.gov.

Page last reviewed: October 07, 2011

Page last updated: October 07, 2011

Content source: [Centers for Disease Control and Prevention](#)

Centers for Disease Control and Prevention 1600 Clifton Road Atlanta, GA 30329-4027, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - [Contact CDC-INFO](#)

